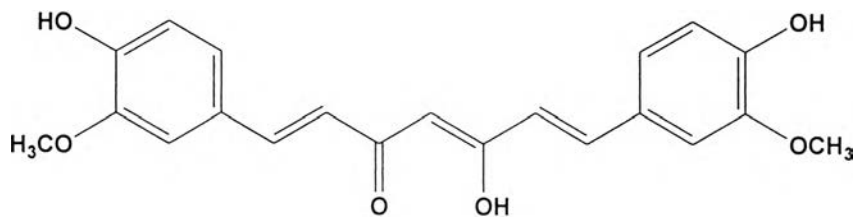
CHAPTER IV

CONCLUSION

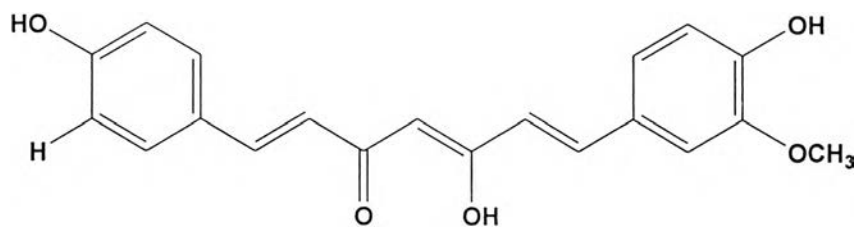
Concisely, the isolation of the dichloromethane and ethyl acetate crude extracts, which there were effective antioxidant activity, obtained five compounds. Their chemical structures were distinguished by means of spectroscopic studies and compared with literature data. These compounds were three major curcuminoids: Curcumin (**1**), Demethoxycurcumin (**2**), and Bisdemethoxycurcumin (**3**), One bisabolane sesquiterpenoid: *ar*-Turmerone (**4**), and one norsesterterpene: 1-Hydroxy-1,2-di-(6-methyl-3-isopropenyl-2-propionyloxy-1-cyclohexene)-1-propene (**5**). The structures of isolated compounds were summarized as followed.



Curcumin (**1**) Total yield : 75.1 mg

(62.3 mg, 7.8×10^{-2} % w/w : CH_2Cl_2 crude extract)

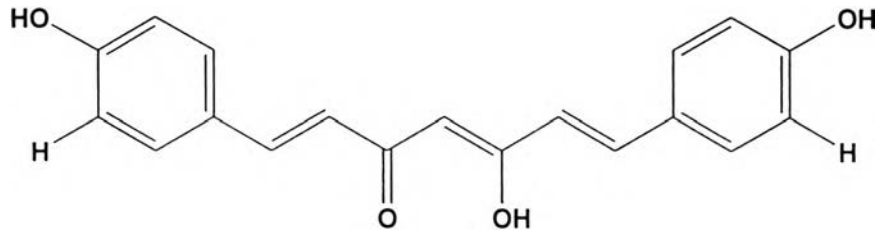
(12.8 mg, 4.9×10^{-2} % w/w : EtOAc crude extract)



Demethoxycurcumin (**2**) Total yield : 50.2 mg

(44.0 mg, 5.5×10^{-2} % w/w: CH_2Cl_2 crude extract)

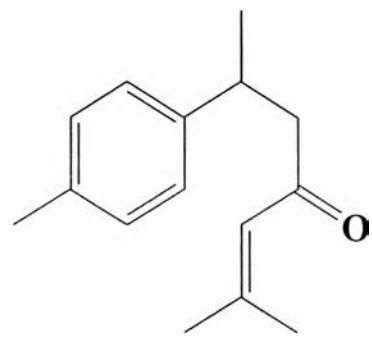
(6.2 mg, 2.4×10^{-2} % w/w: EtOAc crude extract)



Bisdemethoxycurcumin (**3**) Total yield : 31.6 mg

(24.4 mg, 3.0×10^{-2} % w/w: CH_2Cl_2 crude extract)

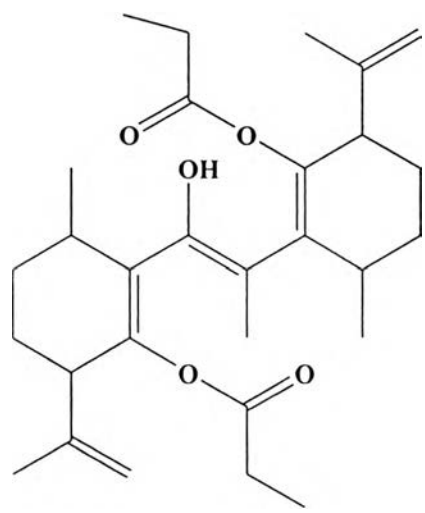
(7.2 mg, 2.8×10^{-2} % w/w: EtOAc crude extract)



ar-Turmerone (**4**) Total yield : 37.8 mg

(20.8 mg, 2.6×10^{-2} % w/w: CH_2Cl_2 crude extract)

(17.0 mg, 6.5×10^{-2} % w/w: EtOAc crude extract)



1-Hydroxy-1,2-di-(6-methyl-3-isopropenyl-

2-propionyloxy-1-cyclohexene)-1-propene (**5**)

Total yield : 52.8 mg, 0.2 % w/w: EtOAc crude extract

As for the chemical investigation of isolated compounds, which obtained from the rhizomes of Waan Ma Lueang (*Curcuma* spp.), this research was firstly reported, remarkably two compounds: *ar*-Turmerone (**4**) and 1-hydroxy-1,2-di-(6-methyl-3-isopropenyl-2-propionyloxy-1-cyclohexene)-1-propene(**5**). Most importantly, the last compound was speculated to be a new compound.

The free radical scavenging activity on DPPH indicated that compounds **1**, **2**, **4**, and **5** exhibited significant activity with IC_{50}= 0.16, 0.27, 0.17, and 0.19 mM, respectively, while compound **3** gave the weakest activity (IC_{50}= >0.50 mM). Their superoxide scavenging activity were in order of compound **1** (IC_{50}=0.31mM), **2** (IC_{50}=0.33 mM), **4** (IC_{50}=0.34 mM), **3** (IC_{50}=0.35 mM), **5** (IC_{50}=0.36 mM). Furthermore, all compounds showed prominently inhibitory activity against xanthine oxidase and lipid peroxidation, especially compound **1** (IC_{50}=0.30 and 0.19 mM), followed by compound **4** (IC_{50}=0.30 and 0.21 mM), **2** (IC_{50}=0.31 and 0.22 mM), **5** (IC_{50}=0.31 and 0.24 mM), and **3** (IC_{50}=0.42 and 0.27 mM), respectively.

Conclusively, Curcumin (**1**) was the most powerful antioxidant against all assay models. Meanwhile, Demethoxycurcumin (**2**), *ar*-Turmerone (**4**), and 1-hydroxy-1.2-di-(6-methyl-3-isopropenyl-2-propionyloxy-1-cyclohexene)-1-propene (**5**) were also highly active. In other words, Bisdemethoxycurcumin (**3**) was the ignoble antioxidant as well as mixture of curcuminoids. From the activity of curcuminoids mixture, it was predicted that curcuminoids did not have the synergistic effect on antioxidant activity.

Proposal for the Future Work

Plants of the Zingiberaceae family are well known to yield a variety of natural compounds for disease treatment. However, many plants in this family, which can be found in Thailand, have not been identified, principally Waan Ma Lueang (*Curcuma* spp.). Hence, this plant should be further identified by taxonomy botanist.

Concerning the antioxidant activity, this research determined some *in vitro* assay models. It was suggested that other *in vitro* assay models should be additionally examined. Furthermore, the *in vivo* assay models of the isolated compounds should be determined to fulfill of this research.